

E-TEST: A compact isolation concept for the Einstein Telescope

Summary

- E-TEST investigates Einstein Telescope suspension and cooling concepts.
- We combine active vibration isolation with low-frequency passive isolation.

Objectives

- Design isolation system.
- Develop cryogenic sensors & cryogenic electronics.
- Radiative cooling strategy.
- Operation of the laser and optics at 2 microns.

Current status and future work

- CAD design of the prototype is ready.
- Manufacturing CAD parts will be launched soon.
- Operating of the system will take place at CSL (Centre Spatial de Liège) – in Belgium by the year-end of 2023.

Inverted Pendulum Platform

To position the marionette plus payload in translational degrees of freedom

Inverted pendulum

Three legs stand on the active platform and isolate horizontally from ~50 mHz.

Marionette

To position the payload in angular degrees of freedom

Outer cryostat (golden) & inner cryostat (green)

No contact between the inner suspended cryostat and outer cryostat deposited on the bench.
The outer cryostat is linked to the He shroud and surrounded by LN2 shroud.
Inner cryostat is linked to nothing
Radiative exchange occurs for the cool down.

Cold Platform

Testbed for cryogenic sensors.

Test mass

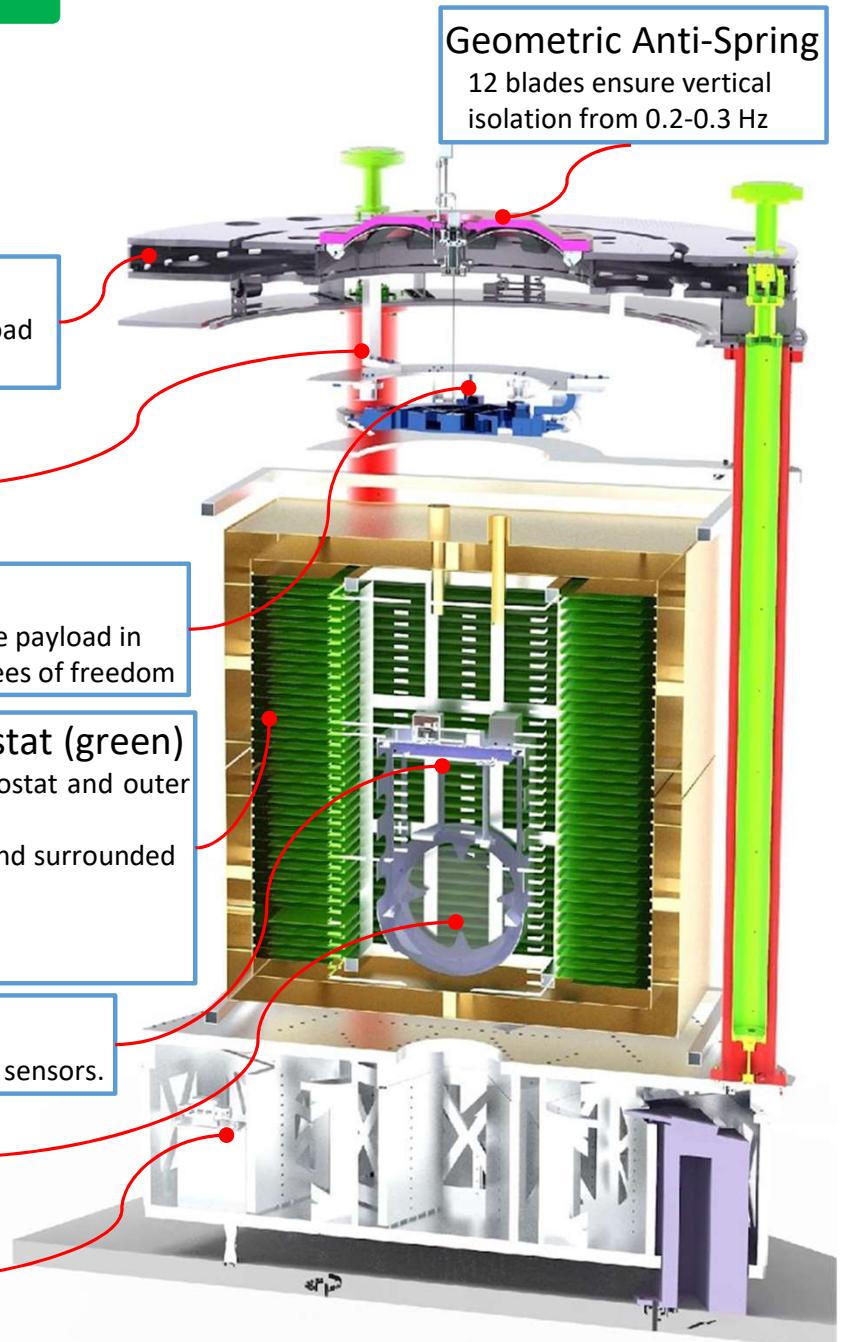
Silicon (50kg).

Active platform

Adapted HAM-ISI table.
First mode > 250 Hz.

Geometric Anti-Spring

12 blades ensure vertical isolation from 0.2-0.3 Hz



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